Priyadarshini Malusare **malusare@alcf.anl.gov**
Last Updated, Oct 22nd 2008 (213) 590-6718

Education

M.S. Computer Science, May 2006
- University of Southern California
- Advisors, Professor Mary Hall and Professor Pedro Diniz
- Area of Study, Computer Architecture and Compiler

B.E. Computer Engineering, May 2004
- University of Pune, India
- with distinction
- Thesis, Compile Time Type Inferencing of Flow Sensitive Polymorphic Types.
- Advisor, Professor Uday Khedker, IIT Bombay
- Area of Study, Programming Languages

Polytechnic, Computer Engineering, May 2001
- Maharashtra State Board of Technical Education, India
- State Merit List Rank 1

Work Experience

Performance Analysis of BlueGene/P dual floating point unit
Argonne National Laboratory July 2008-current
- Currently working on investigating vectorization capabilities of IBM XL compiler for Blue Gene/P supercomputer.

OpenAnalysis
Argonne National Laboratory July 2006-July 2008
- Funded by U.S. Department of Energy
- Developed an infrastructure to support compiler intermediate representation (IR) independent program analysis for imperative programming languages.
- Refined general and domain-sepcific program analyses from 20 hours to 30 minutes for MITgcm, a numerical benchmark for studying ocean and climate
- Fixed more than 50 bugs in the program analysis by extending the regression test framework.
- Refined functionalities of analysis specific interface to improve programmability
- Reimplemented OpenAnalysis abstractions in order to get precise information from IRs.
- Implemented prototype dataflow analysis framework for analysis over control flow graphs, interprocedural control flow graphs and call graphs.
- Extending OpenAnalysis to support new domain specific analyses, adding multiple algorithms for these analysis, and providing interface for various compilers.
- Developing analysis specific interface for Open64 (Rice University) and ROSE (LLNL) compiler
- Contributing OpenAnalysis tutorial

Compiler for Transaction Coherence and Consistency Parallel Programming Model
Information Sciences Institute, University of Southern California Jan 2005- May 2006
- Funded by National Science Foundation
- Extended SUIF1 compiler intermediate represenation to support transactional memory (TM) programming with a set of compiler directives.
- Implemented software TM specific optimizations on the top of SUIF

- Performed experiments on NAS and SPEC benchmarks using TCC compiler (USC) and TASSEL simulator (Stanford)

Compiler directed Array replication in Configurable Architectures
Information Sciences Institute, University of Southern California Jan 2005- Dec 2005

- Funded by National Science Foundation
- Primary research contribution was, application of array replication tranfromation to take advantage of flexibility of configurable architectures.
- Extended exisiting array data-flow analysis to identify opportunities for concurrent execution of entire loops when array sections are replicated.
- Presented experimental results for compiler analysis and array data replication algorithm for mapping set of kernel computations to a contemparary configurable device - Xlinix Virtex FPGA.

Compile Time Inferencing of Flow-Sensitive Polymorphic Types
Indian Institute of Technology, Bombay Sep 2003-May 2004

- Extended bi-directional data flow analysis for polymorphic type inferencing
- Demonstrated that the framework for polymorphic type inferencing works for monomorphic examples without any significant modifications
- Showed static analysis of dynamic polymorphism provide an opportunity for program optimizations as well as ensures type safety

Publication

- Array Replication to Increase Parallelism in Applications Mapped to Configurable Architectures, with H. Ziegler and P. Diniz. In Proc. of the 18th Workshop on Languages and Compilers for Parallel Computing (LCPC'05) Oct. 2005. Published as Notes in Computer Science (LNCS), Vol 3602.pp. 455-469, Springer, Berlin, 2005.
- Design and Implementation of Context-Sensitive and Flow-Sensitive Activity Analysis for Automatic Differentiation, Jaewook Shin, Priyadarshini Malusare, Paul Hovland. Published in 5th International Cnference on Automatic Differentiation.

Activities

- Member of Grace Hopper Women in Computing
- Oregon Summer School, July 07
- Co-ordinated Math-Puzzels, Argonne National Lab Open House 06.